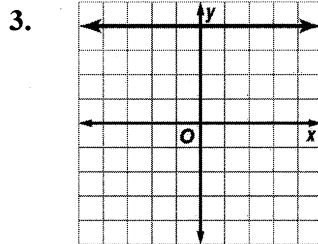
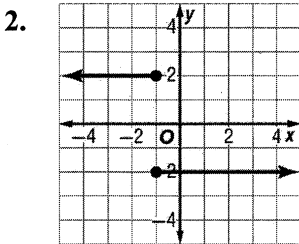


Chapter 2 Midterm Exam Review

1. Find the domain and range of the relation $\{(0, 0), (2, 4), (-4, 0), (4, 0)\}$. Then determine whether the relation is a function.

D: $\{0, 2, -4, 4\}$
 1. R: $\{0, 4\}$ yes

Determine whether each relation is a function.



2. No
 3. yes

Find each value if $f(x) = -3x + 2x^2$ and $g(x) = -4x^2 + 2x - 3$.

4. $f(-2) = -3(-2) + 2(-2)^2 = 6 + 2(4)$
 5. $g(a) = -4a^2 + 2a - 3$

4. 14
 5. $-4a^2 + 2a - 3$

For Questions 6 and 7, state whether each equation or function is linear. If no, explain your reasoning.

6. $f(x) = 100x - 37$ 7. $xy - 60 = 0$

8. Write $\frac{2}{3}x - 1 = 8y$ in standard form. Identify A, B, and C.
 $2x - 3 = 24y$

6. yes
 7. No; the xy!
 8. $2x - 24y = 3$

9. Find the x-intercept and the y-intercept of the graph of $4y - 12 = 3x$.

$4(0) - 12 = 3x$
 $-12 = 3x$
 $-4 = x$

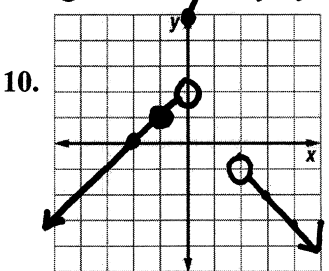
$4y - 12 = 3(0)$
 $4y = 12$
 $y = 3$

9. $(-4, 0)$ and $(0, 3)$

For Questions 10–12, graph each.

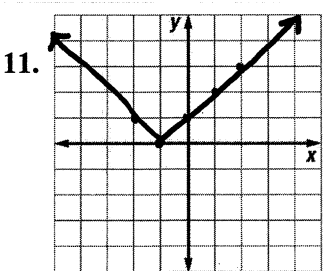
10. $f(x) = \begin{cases} x + 2 & \text{if } x < 0 \\ 2x + 5 & \text{if } 0 \leq x \leq 2 \\ -x + 1 & \text{if } x > 2 \end{cases}$

$x < 0$		$0 \leq x \leq 2$		$x > 2$	
x	y	x	y	x	y
-1	1	0	5	$\frac{2}{3}$	-2
-2	0	2	9	4	-3



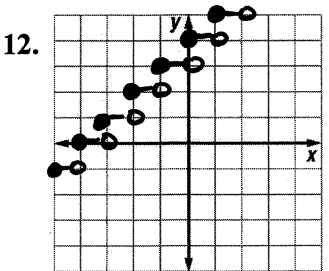
11. $h(x) = |x + 1|$

x	y
-2	1
-1	0
0	1
1	2
2	3



12. $f(x) = \lceil x \rceil + 4$

x	y
-3	1
-2.5	1
-2	2
-1.5	2
-1	3
-0.5	3
0	4
0.5	4
1	5



13. Identify the type of function represented by the equation $y = 2|x|$.

13. Absolute Value

14. Find the slope of the line that passes through (2, 18) and (4, -2).

14. $m = -10$

$$m = \frac{-2 - 18}{4 - 2} = \frac{-20}{2}$$

15. What is the slope of a line that is perpendicular to the graph of $y = \frac{1}{2}x$?

15. $m = -2$

16. Write an equation in slope-intercept form for the line that has a slope of -1 that passes through (-4, 3).

16. $y = -x - 1$

$$y - 3 = -1(x - -4)$$

$$y - 3 = -x - 4$$

17. Write an equation in slope-intercept form for the line that passes through (2, -5) and is parallel to the line whose equation is $5x + 2y = 6$.

17. $y = -\frac{5}{2}x$

$$y - -5 = \frac{-5}{2}(x - 2)$$

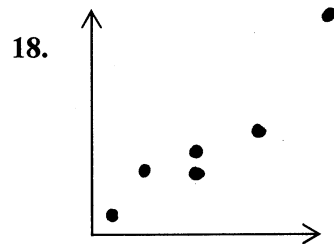
$$y + 5 = -\frac{5}{2}x + 5$$

$$\frac{2y}{2} = \frac{-5x + 6}{2} \quad \frac{2}{2}$$

For Questions 18 and 19, use the set of data in the table.

The table below shows the relationship between the number of phone calls made and the number of tickets sold during a fundraising campaign by 6 callers.

Calls Made (n)	8	9	7	8	6	12
Tickets Sold (t)	16	17	15	15	12	25



18. Sketch the scatter plot for the data.

18.

19. Use your calculator to find the regression line.

19. $y = 2.09x - .78$

20. Then use your prediction equation to predict the number of tickets sold when 16 calls are made.

20. $y = 32.66$

$$y = 2.09(16) - .78$$

21. Then use your prediction equation to predict the number of calls made if 20 tickets are sold.

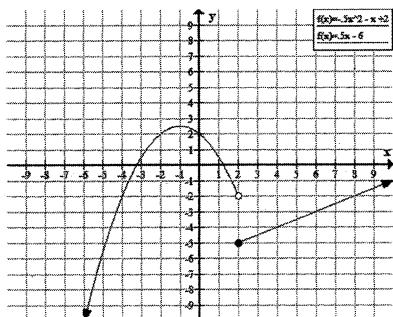
21. $x = 9.94$

$$20 = 2.09x - .78$$

$$\frac{20.78}{2.09} = \frac{2.09x}{2.09}$$

22. Determine whether the graph represents a step function, a constant function, an absolute value function, or a piecewise function.

22. piecewise



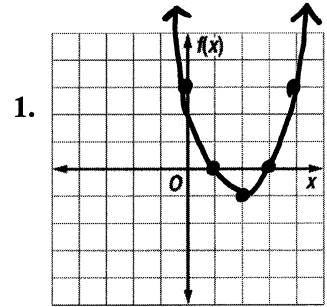
Chapter 4 Exam Review

1. Solve by graphing. Complete all parts for $f(x) = x^2 - 4x + 3$.
- Find the y -intercept, the axis of symmetry, and the vertex.
 - Make a table and graph the parabola
 - Determine whether each function has a maximum or a minimum value, and find it
 - Find the roots. If exact roots cannot be found, state the numbers between which the roots are located.

yint: 3
axis: $\frac{-(-4)}{2(1)} = 2$
vertex: (2, -1)

x	y
0	3
1	0
2	-1
3	0
4	3

min at -1
roots: $\boxed{x=1, x=3}$

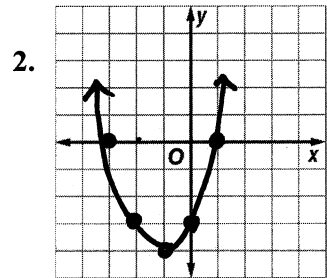


2. Solve by graphing. Complete all parts for $f(x) = x^2 + 2x - 3$.
- Find the y -intercept, the axis of symmetry, and the vertex.
 - Make a table and graph the parabola
 - Determine whether each function has a maximum or a minimum value, and find it
 - Find the roots. If exact roots cannot be found, state the numbers between which the roots are located.

yint: -3
axis: $\frac{-2}{2(1)} = -1$
vertex: (-1, -4)

x	y
-3	0
-2	-3
-1	-4
0	-3
1	0

min at -4
roots: $\boxed{x=-3, x=1}$



3. Determine whether $f(x) = 5x^2 - 20x + 3$ has a maximum or a minimum value and find that value.

3. minimum at -17

4. Solve $3x^2 - x = 4$ by factoring.

$a \neq 1$

$3x^2 - x - 4 = 0$
 $3x^2 + 3x - 4x - 4 = 0$
 $3x(x+1) - 4(x+1) = 0$
 $(3x-4)(x+1) = 0$

4. $x = -1, x = 4/3$

5. Solve $8x^2 - 64x = 0$ by factoring.

$8x(x-8) = 0$

5. $x = 0, x = 8$

6. Solve $x^2 - 6x + 5 = 0$ by factoring.

$(x-5)(x-1) = 0$

6. $x = 5, x = 1$

7. Solve $4x^2 - 4x - 3 = 0$ by factoring.

$4x^2 + 2x - 6x - 3 = 0$
 $2x(2x+1) - 3(2x+1) = 0$

7. $x = -\frac{1}{2}, x = \frac{3}{2}$

8. Solve $4x^2 + 9 = 0$ by using the Square Root Property.

$\frac{4x^2}{4} = -\frac{9}{4}$

8. $x = \pm \frac{3}{2}i$

9. Solve $9x^2 + 12x + 4 = 6$ by using the Square Root Property.

$\sqrt{(3x+2)^2} = \sqrt{6}$
 $3x+2 = \pm\sqrt{6}$
 $3x = -2 \pm\sqrt{6}$

9. $x = \frac{-2 \pm \sqrt{6}}{3}$

10. Solve $x^2 - 8x + 14 = 0$ by Completing the Square.

$x^2 - 8x + 16 = -14 + 16$
 $(x-4)^2 = 2$

10. $x = 4 \pm \sqrt{2}$

11. Solve $3x^2 + x - 2 = 0$ by Completing the Square.

$\frac{3}{3} \frac{x^2}{3} + \frac{x}{3} - \frac{2}{3} = 0$
 $x^2 + \frac{1}{3}x + \frac{1}{36} = \frac{2}{3} + \frac{1}{36}$
 $\sqrt{(x+\frac{1}{6})^2} = \sqrt{\frac{29}{36}}$
 $x + \frac{1}{6} = \pm \frac{\sqrt{29}}{6}$

11. $x = \frac{2}{3}, x = -1$

12. $x = \frac{9 \pm \sqrt{41}}{4}$

12. Find the solutions to $2x^2 = 9x - 5$ by using the Quadratic Formula.

$x = \frac{-(-9) \pm \sqrt{(-9)^2 - 4(2)(5)}}{2(2)}$

13. $x = \frac{3 \pm 2i\sqrt{3}}{1}$

13. Find the solutions to $x^2 - 6x + 21 = 0$ by using the Quadratic Formula.

$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(21)}}{2(1)}$

$x = \frac{6 \pm 4i\sqrt{3}}{2}$

Chapter 5 Midterm Exam Review

Simplify. Assume that no variable equals 0.

1. $(2c^2d^0)^3(5c^7d^2)$
 $8c^6 \cdot 5c^7d^2$

2. $\frac{12a^2b^4c^5}{48a^6b^3c^3}$

1. $\frac{40c^{13}d^2}{bc^2}$
 2. $\frac{bc^2}{4a^4}$

For Questions 3–5, simplify.

3. $(3f^2 + 5f - 9) + (4f^2 - 7f + 12)$

4. $(5m - 6)(2m + 1)$

5. $(6g^3 - 2g + 1) - (3g^2 + 5g - 7)$

6. Simplify $(11k^2 + 10k^3 - 4k^2)(3k^2 - 2k)$.

3. $7f^2 - 2f + 3$
 4. $10m^2 - 7m - 6$
 5. $6g^3 - 3g^2 - 7g + 8$
 6. _____

For Questions 7–8, find the function.

7. Find $p(-4)$ if $p(x) = x^3 - 3x^2 + 7x + 6$.

8. Find $p(x + 1)$ if $p(x) = x^2 - 4x + 2$.

$(x+1)^2 - 4(x+1) + 2$
 $x^2 + 2x + 1$

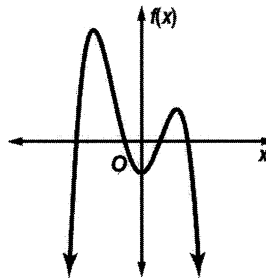
7. -134
 8. $x^2 - 2x - 1$

For Questions 9–11, use the graph shown.

9. Describe the end behavior.

10. Determine whether the graph represents an odd-degree or an even-degree polynomial function.

11. Determine whether the graph represents a positive leading coefficient or a negative leading coefficient.



9. fall on left & right
 10. Even
 11. negative
 12. 4

12. State the number of real zeros.

Solve the following polynomials by factoring.

13. $5x^3 - 12x^2 + 4x = 0$

$x(5x^2 - 12x + 4) = 0$
 $x(5x^2 - 10x - 2x + 4) = 0$

14. $x^3 + 5x^2 + 2x + 10 = 0$

$x(5x-2)(x-2) \quad x^2(x+5) + 2(x+5) = 0$
 $(x^2+2)(x+5)$

15. $x^4 + 6x^2 + 5 = 0$

$(x^2+1)(x^2+5) = 0$
 $x = \pm i \quad x = \pm i\sqrt{5}$

16. $x^3 - 8 = 0$

$(x-2)(x^2+2x+4) = 0$

$x = \frac{-2 \pm \sqrt{2^2 - 4(1)(4)}}{2(1)}$
 $x = \frac{-2 \pm \sqrt{-12}}{2}$
 $x = \frac{-2 \pm 2i\sqrt{3}}{2}$

13. $x=0 \quad x=\frac{2}{5} \quad x=2$
 14. $x=-5 \quad x=\pm i\sqrt{2}$
 15. $x=\pm i \quad x=\pm i\sqrt{5}$
 16. $x=2 \quad x=-1 \pm i\sqrt{3}$

Use long division or synthetic division to solve the following.

17. $(2x^3 + 3x^2 - 15) \div (2x - 1)$

18. $(x^3 + 5x^2 - 32x - 7) \div (x - 4)$

17. $x^2 + 2x + 1 - \frac{14}{2x-1}$
 18. $x^2 + 9x + 4 + \frac{9}{2x-1}$

$$\begin{array}{r} 2x-1 \overline{) 2x^3+3x^2+0x-15} \\ \underline{2x^3+1x^2} \\ 4x^2+10x \\ \underline{4x^2+12x} \\ 2x-15 \end{array}$$

$$\begin{array}{r} 4 \overline{) 1 \ 5 \ -32 \ -7} \\ + \underline{4 \ 20} \\ 1 \ 9 \ 4 \ \underline{36} \end{array}$$

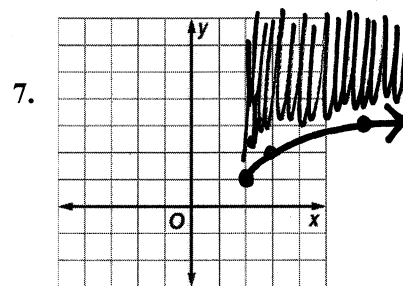
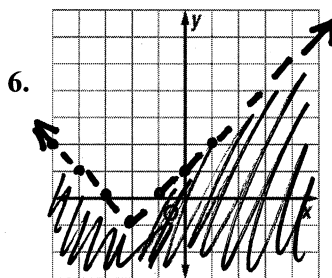
Chapter 6 Midterm Exam Review

- Find $(f \cdot g)(x)$ for $f(x) = x^2 - 4$ and $g(x) = 6 - x$.
- If $f(x) = 2x - 7$ and $g(x) = x^2 - 5$, find $g[f(5)]$.
- If $f(x) = 3 - x$ and $g(x) = x^2 - 4$, find $[g \circ f](x)$.
- Find the inverse of $g(x) = -2x + 4$.
- Determine whether $f(x) = 4x - 8$ and $g(x) = \frac{1}{4}x + 2$ are inverse functions.

- $-x^3 + 6x^2 + 4x - 24$
- 4
- $x^2 - 6x + 5$
- $g^{-1}(x) = \frac{x-4}{-2}$
- yes

For questions 6-7, graph the inequalities.

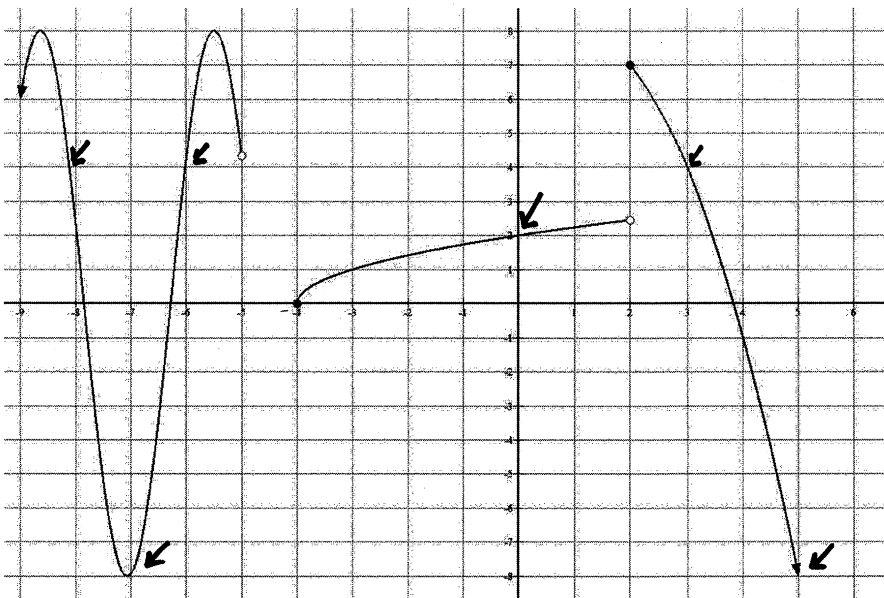
- $y < |x + 2| - 1$.
- $y \geq \sqrt{x - 2} + 1$.



More Exam Review

For Questions 1-4, use the graph.

- Find $f(0)$. 2
- Find $f(-5)$. NA
- Find x , such that $f(x) = 4$.
-8, -6, 3
- Find x , such that $f(x) = -8$.
-7 & 5



Write the equation of the piecewise function.

- $f(x) = \begin{cases} 3 & \text{if } x < -2 \\ x+3 & \text{if } -2 \leq x < 1 \\ -2x+5 & \text{if } x > 1 \end{cases}$

